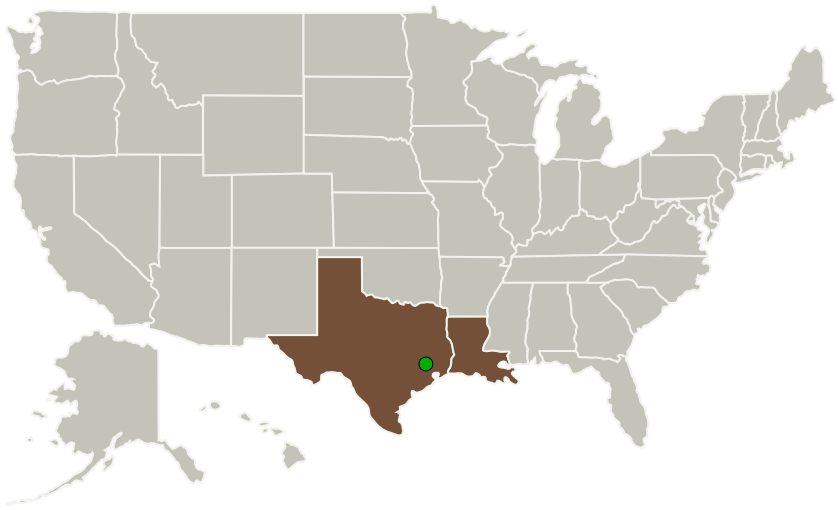
Micro tube heat exchangers for Space, Phase I

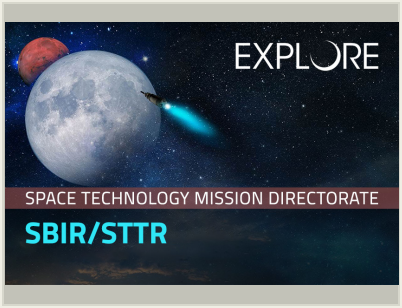
Completed Technology Project (2012 - 2012)

Project Introduction

Mezzo fabricates micro tube heat exchangers for a variety of applications, including aerospace, automotive racing, Department of Defense ground vehicles, economizers for ships, condensers, evaporators, liquid-liquid, liquid-air, recuperators, etc. Mezzo's expertise is designing, modeling and fabricating heat exchangers that use thousands, even tens of thousands, of stainless steel or nickel alloy micro tubes that provide performance advantages over competing technologies. With respect to radiators, Mezzo's products provide a heat transfer/air side pressure drop ratio improvement of around 40-50%. This means that within a given envelope and specified air flow rate, Mezzo's products can provide a specified heat transfer with greatly reduced air side pressure drop. This fact allows lighter fans that consume less power and weigh less. In general, Mezzo products weigh less for given heat transfer. In high pressure applications, Mezzo heat exchangers provide even greater reductions in weight and volume. Mezzo is currently fabricting an economizer for the Navy that is les than half the weight and volume of the brazed plate heat exchanger currently in use. There are many advantages to Mezzo's micro tube technology. The technology is robust (Mezzo's products are currently passing rigorous DoD shock and vibration tests, salt fog tests, fouling tests, etc. Mezzo heat exchangers provide weight, volume, and performance savings. They have interesting capabilities with respect to shape options. Finally, they have not been considered yet in NASA applications. The goal of this proposal is to introduce the NASA community to Mezzo products and determine those applications where Mezzo's heat exchangers can provide the most value.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Mezzo Technologies	Lead Organization	Industry	Baton Rouge, Louisiana
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Louisiana	Texas

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138299)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Mezzo Technologies

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

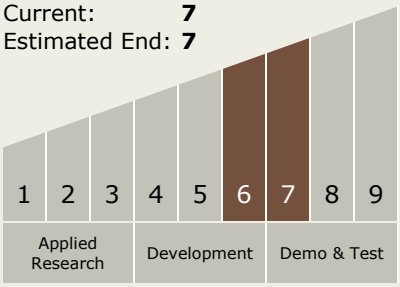
Carlos Torrez

Principal Investigator:

Jeffrey J Mclean

Technology Maturity (TRL)

Start: **6**
Current: **7**
Estimated End: **7**



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Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.2 Heat Transport

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System